1994

Department of Chemistry annual report, 1993-94

University of Central Florida. Department of Chemistry

DEPARTMENT OF CHEMISTRY

ANNUAL REPORT

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1. INTRODUCTION

A. Background

The Chemistry Department and its B. S. degree program were established in 1969 concurrently with the opening of the University of Central Florida (then, Florida Technological University). This B. S. program was certified as meeting the extensive requirements of the American Chemical Society in 1974. Recertification has been accomplished every five years since meeting the initial qualifications. In 1974, the M. S. program in Industrial Chemistry and the B. S. program in Forensic Science were added to the offerings of the Department.

B. Departmental Status

The Department began with four faculty members in 1968 and increased to eleven by 1976. Even though the productivity of the Department in majors, FTE, etc. has increased greatly, the number of faculty members has not changed much since 1971. Currently, the Department has fourteen faculty members, including one in full-time administration, one a geologist, and one who is responsible for the Forensic Science program. Two of these faculty members have been added in the past five years. We expect to add at least four faculty members over the next two years, two being replacements for retiring and/or departing faculty. A cooperative relationship has been established with Florida Hospital's Walt Disney Memorial Cancer Institute, and one of their scientists will have a tenure earning position in the Chemistry Department as Assistant Professor of Chemistry. Four more of their scientists have received affiliated appointments and will be discussed at the end of this section.

The undergraduate degree program in Chemistry at UCF has established a reputation for producing outstanding students who are very capable of pursuing advanced degrees or going to work immediately for chemical or chemical related industries. Over 70% of our undergraduate chemistry majors in the past five years have pursued graduate or

professional studies. These excellent undergraduate products of our program are, in large part, due to the interest our faculty have in our students and the involvement of all Chemistry majors in faculty research efforts.

The Department has won seven Excellence in Teaching awards in the past fifteen years, far more than any other department. Four of these awards have been at the University level (one has been given each year for the past fifteen years) and three at the College level. In addition, the faculty have won University wide research awards. All of our faculty involve students in their research, and this contributes significantly to the outstanding preparation of these students. It is the opinion of our faculty, and has been since the inception of the University, that there is no better place to teach chemistry than in the research laboratory. Therefore, we see no separation in teaching and research.

As mentioned in the previous paragraph, research is a very important part of the professional life of our faculty. Faculty are selected for their potential as teachers and researchers. They are expected to establish significant research programs that contribute to tomorrow's knowledge and provide a place for both undergraduate and graduate students to reach their potential. The success of our research efforts can be seen in the extent of current funding which has averaged over $800,000 in each of the last three years (over $1,000,000 in 1993-94) and in the number of faculty receiving University research awards. It is our expectation that we will have even more success as we add new faculty who are interested in making a contribution to their respective fields.

Examination of our faculty's annual reports for the past five years will indicate the commitment to service activity at the College and University level, the State University System, their professional societies and their communities. Because of the professional manner in which our faculty serve their University, they are constantly requested to take an important role in many of the campus committees.

Plans for the future of the Department are extensive and some of these goals will be developed in the latter part of this report. One of the major problems we must deal with effectively is how can we provide proper

access to Chemistry courses, especially laboratory courses? This will require a close examination of resources of all types, i.e., expense, OCO and personnel. In addition, with the ever increasing student to faculty ratios, we must strive to find better ways to maintain our quality of instruction. The Department has always placed an emphasis on the individual and on quality teaching. With the large increase in students, it is difficult to provide the needed student help and give the individual attention needed.

The Department will continue to plan for a Ph.D. degree program which is expected to be implemented within three to five years. Assisting with the feasibility of a Ph.D. program will be our expanding relationship with Florida Hospital through the Walt Disney Memorial Cancer Institute. The implementation of the plans for beginning the Institute for Drug Development and Innovative Therapies will add needed faculty and resources to the Department and will help with both graduate and undergraduate programs.

C. **Faculty and Staff – Notable Changes**

There were no changes in the support staff for the Department which includes five USPS full-time staff employees; one Laboratory Manager, one Laboratory Assistant, one Office Manager, one Senior Secretary and one Senior Engineering Technician/Designer. In addition, we employed one OPS part-time secretary, one part-time OPS Instrument Engineer and seven work study students (two in the Department office and five in the laboratory stockroom).

1. **Identify New faculty by Name and Highest Degree**

Dr. Barry Schweitzer - Ph.D. in Pharmacology from Yale University. Dr. Schweitzer was hired as a scientist with the Walt Disney Memorial Cancer Institute and was appointed as Assistant Professor of Chemistry in a tenure earning line. Dr. Schweitzer will teach one course per term for the Department and will contribute significantly to our research efforts and to the direction of graduate research.

2. Describe Current Teaching and Research Faculty

a. Number of Full-Time Faculty

There are fourteen full-time faculty members (including the Chair) and one part-time faculty member, Dr. Hertel, who only teaches in the spring term.

One of our faculty members, Dr. Frank Juge, is in full-time administration as Vice Provost of Academic Affairs. A second faculty member, Dr. Frank Kujawa, is one-half time with the UFF (faculty union) and teaches the geology classes. A third faculty member, Dr. William McGee, is responsible for the Forensic Science program. Dr. Kathleen Richardson, Assistant Professor of Chemistry, is a scientist with CREOL and normally teaches one course per term. She is very active in research and in directing graduate students. There was one faculty member, Dr. Howard Miles, who was on leave in the 1993-94 academic year on a USAID project in Indonesia. Dr. Michael McCann, Assistant Professor of Chemistry, resigned at the end of the spring term.

b. Number of Adjunct Faculty

The Department hired one adjunct for the spring term who taught a course in Forensic Science.

c. Number of Graduate Teaching Assistants

The Department hired seven Graduate Teaching Assistants in the fall, ten in the spring and three in the summer of 1993.

d. Number of Research Assistant, Post-Docs, and Other Research Faculty

One post-doctoral Research Fellow, Dr. Scott Petrich, was employed through a grant from the Camille and Henry Dryfus Foundation in Dr. Gupton's research laboratory.

Seven Graduate Research Assistants were hired in the fall, five in the spring, and ten in the summer of 1993.

e. **Number of Courtesy Appointments**

There were four courtesy appointments:

Dr. Samuel Gross, M.D., University of Rochester - "Distinguished Professor of Chemistry"
Dr. Gross is the Medical Director at the Walt Disney Memorial Cancer Institute at Florida Hospital.

Dr. Clifford Selsky, Ph.D., Microbiology Molecular Genetics, University of Miami -
"Associate Professor of Chemistry"
Dr. Selsky is the Medical Director of the Hematology and Oncology for Children and Adolescents at the Walt Disney Memorial Cancer Institute at Florida Hospital.

Dr. John Francis, Ph.D. Hemostasiology, Southampton University - "Professor of Chemistry"
Dr. Francis is the Director of Hemostasis and Thrombosis Research at the Walt Disney Memorial Cancer Institute at Florida Hospital.

Dr. Stuart Roath, M.D. University of Wales -
"Professor of Chemistry"
Dr. Roath is the Associate Director of Transnational Chemical Research at the Walt Disney Memorial Cancer Institute at Florida Hospital.

All of the faculty receiving affiliated appointments are scientists hired in the last year by the Walt Disney Memorial Cancer Institute at Florida Hospital's research center. These are outstanding scientists who will contribute significantly to our research effort and to the direction of graduate students and to the development of the Institute for Drug Development and Innovative Therapies.

2. ANALYSIS OF UNDERGRADUATE PROGRAMS

A. Student Enrollment

1. Undergraduate Majors and Minors

The national trend in the number of Chemistry majors has been a slow decline. At UCF, there has been a slow but steady increase, with an increase of 7.7% from 1988 through 1991 and a sharp rise of 24% in 1992-93. The current data indicates that the number increased greater than 11% in 1993-94. There are also another 50+ Chemistry majors that we have classified as inactive because they have not taken a course in two semester. The 1994-95 early registration records show 57 newly declared Chemistry majors. Subtracting thirteen graduates for 1993-94 would mean a 38% increase in the number of declared Chemistry majors for 1994-95. Thus, the Chemistry program at UCF is doing better than the national average in terms of head count.

The significant increase in the number of Chemistry majors may be due to several reasons. It is my opinion that the soft job market in engineering, business and biology is causing some students to turn to chemistry and the medical sciences. The job market for graduates has been more consistent in those areas.

The number of Forensic Science majors reached a low point in 1990-91, but has shown a steady increase to this point in time. The increase has been remarkable since that time with an increase from 12 in 1990-91 to 30 in 1991-92.

The continued rise was seen in 1992-93 (38 students). The data for 1993-94 shows a remarkable increase of 58%, giving a total of 60 majors. It appears that another increase of 30% to 50% is in store for 1994-95, using early registration figures. I do not foresee the numbers to keep increasing at this level because the demand for graduates is limited primarily to government laboratories. In addition, we currently have one faculty devoted to this program and there is a limit as to the student load he can handle.

Chemistry and Forensic Majors

DISCIPLINE	1989-90	1990-91	1991-92	1992-93	1993-94
Chemistry	78	81	85	105	116
Forensic Science	19	12	30	38	60

2. Headcount Enrollments

The headcount in our classes has increased consistently during the past five years with the average increase being 6% as is indicated by the student credit hour productivity to be completed.

Headcount by Major - Undergraduate

	Chemistry			Forensic Science		
	1992	1993	1994	1992	1993	1994
Freshmen	8	13	25	2	6	2
Sophomores	12	19	22	2	9	7
Juniors	16	26	17	8	11	23
Seniors	38	40	53	8	19	28
Total	75*	98	117	20	45	60

*Includes 1 post-bac.

The head count exactly parallels with the number of majors and my comments in that section would apply to this section as well.

3. Distribution of Courses Offered

The distribution of the courses has not changed significantly in the last five years. Approximately 65% of the lecture courses offered in the fall and spring are upper division and 35% in the lower division. In laboratory offerings, the ratio is reversed with approximately 65% being lower division and 35% upper division. This switch is due to the large number of laboratory and discussion sections associated with the large enrollment lecture sections of our

General Chemistry sections. These ratios have not changed significantly in the last five years.

In the summer, large enrollment classes have been the choice because of limited funds. These are primarily our freshman level courses and the junior level Organic Chemistry. In most years, summer laboratory offerings have been small because of the low student credit hour productivity. However, we have dramatically increased the number of laboratory offerings because our greatest available capacity is in the summer, and we will have to do more in the fall and spring terms since each section is limited to 24 work stations, and we are approaching a capacity for our General Chemistry and Organic Chemistry laboratory courses. The total number of sections is limited by the number of individual drawers available and available blocks of time.

Undergraduate Lower Level Course Offerings
Number of Sections Offered

	1991			1992			1993			1994		
	Lec	Lab	Disc	Lec	Lab	Disc	Lec	Lab	Disc	Lec	Lab	Disc
Summer	4	1	1	3	0	0	6	3	2	6	3	2
Fall	7	3	18	8	3	18	7	5	18	7	5	20
Spring	8	6	11	8	7	11	8	9	7	8	14	6

Upper Level Undergraduate Course Offerings
Number of Sections Offered

	1991		1992		1993		1994	
	Lec	Lab	Lec	Lab	Lec	Lab	Lec	Lab
Summer	1	1	2	0	2	2	2	1
Fall	10	8	9	8	9	8	9	8
Spring	11	8	9	7	11	9	12	9

B. Program Productivity Trends (Over Past 5 Years)

1. Student Credit Hour (SCH) Production

There has been a consistent increase in student credit hour productivity with the average over the past five years at 6%. This trend is expected to continue.

Undergraduate Student Credit Hours

Years	1989-90	1990-91	1991-92	1992-93	1993-94
SCH Total	8,815	9,388	9,722	10,272	13,629

2. Number of Graduates

Nationally, most chemistry programs have been on a very slow decline in the number of graduates. Our number of chemistry majors has remained relatively constant over the past five years. However, the number is expected to rise in 1994-95, 1995-96 and 1996-97, if one can judge by the number of students declaring chemistry as a major in 1992-93, which was an increase by 24% over 1991-92. In 1993-94, there was an 11% increase over 1993-94. The number of new majors for the fall of '94 is 57. Subtracting the number of graduates (13) would give us over a 30% increase in number of majors. This increase in number of majors should translate into an increase in the number of graduates in the future.

The Forensic Science program has been low in productivity in terms of numbers, but is a high value to Florida and the nation in that it provides very specialized forensic chemists for our law enforcement laboratories. The number of graduates is expected to rise to an average of five per year in 1993-94 and perhaps even higher in the future if we can judge by the increase in majors. The number of students choosing Forensic Science as a major increased from 12 students in 1990-91, to 30 students in 1991-92, to 38 in 1992-93, and to 60 in 1993-94. Current data indicates an increase to

approximately 80 majors for the fall of 1994. There should be a substantial increase in majors in 1996-97 and beyond. I do not expect the increase in majors to keep climbing at this current rate since the job market for these majors is somewhat limited. In addition, we must increase faculty members in this program (currently there is only one) in order to handle the growth.

Number of Undergraduate Chemistry and Forensic Majors Graduating per Year

Discipline	1990-91	1991-92	1992-93	1993-94	Total
Chemistry	13	12	11	13	64
Forensic Science	2	5	4	2	15

C. Program Quality

1. Curriculum Relevance and Innovativeness

The chemistry curriculum at UCF has been accredited continuously by the American Chemical Society since 1973. The curriculum guidelines for accreditation are relatively stringent and leave little room for flexibility in terms of type of courses offered. Recently an inorganic chemistry laboratory course was added due to a change in professional accreditation guidelines. A five year accreditation report was prepared for submission to the American Chemical Society on July 15, 1993. An especially important part of our curriculum is undergraduate research. All students are expected to be involved in undergraduate research and are required to take at least one year. It has been our observation that there is no better place to teach chemistry than in the research laboratory. The opportunity for this type of involvement with state- of-the-art research utilizing state of the art equipment is not available for undergraduate students in most universities. Many students give presentations at regional and national meetings and have

publications with faculty in national journals as a result of their undergraduate research. Our undergraduate research programs in Analytical Chemistry and Biochemistry have been highlighted in the quarterly Journal of Undergraduate Research. In the last issue, our Chemistry Building graced the front cover of this national journal.

Contact with alumni, employers and external reviewers (BOR) all praise the quality of our chemistry majors, thus indicating the relevance and value of our curriculum. The undergraduate research experience gives them a great advantage over most students. The University must take a look at the value of this course and fund it properly.

The Forensic Science major takes most of the same courses as the Chemistry major through the junior year. The specialized Forensic Science major begins in the junior year and is concentrated in the senior year. Especially noteworthy is internship, which is served in a fully functional crime laboratory in the senior year. The internship is for one semester and our students have served internships in some of the best forensic laboratories in the United States. The contact and work with the top laboratory scientists in this field is invaluable.

2. **Program Standards**

All B.S. chemistry majors at UCF take the ACS accredited program. This means that a student will graduate with a minimum of 128 hours of credit and a minimum of 178 contact hours. Student course demand is especially high for our General Chemistry, Organic Chemistry, Analytical, and Biochemistry courses. Availability of large classrooms, laboratory space, GTA's, faculty and sufficient expense budget have limited our capability to meet these demands. Especially critical is the lack of sufficient laboratory space and expense budget to meet the demands for our General and Organic Chemistry courses.

The teaching evaluations of our courses are taken very seriously. In addition, the performance of the chemistry majors and other science majors in graduate school or in places of employment

is closely monitored. Feedback from these sources is used to improve classroom effectiveness. Results of this attention to the teaching function can be seen in that four of our faculty have won the University teaching awards (one given per year) and six have won the College award. This far exceeds any other department at UCF.

We are in the process of an extensive examination of our freshman course for science majors. Dr. Hampton has the coordination responsibility for the lecture, and Dr. Clausen for the laboratory. We want students to come out of the freshman course excited about chemistry and not to think of it as a hurdle to get over. There are many new and effective methods that can be used to improve presentation and delivery of chemistry to students. Some of the high tech multi media approaches will be examined. Dr. Hampton will be attending a conference on effective teaching of large sections and we will be looking at the possibility of bringing a consultant from a university that has effectively redesigned their general chemistry sequence. One example of an effective modification has been at William and Mary University. In addition, Dr. Clausen, with the help of Dr. Hampton, is designing new laboratory experiments which can safely and effectively illustrate chemical principles on a discovery rather than on a cookbook basis. Several other laboratory courses are being updated with the addition of new experiments. In some courses this has required the purchase of new equipment to make the upgrade possible. In the last four years the Department has received over $400,000 worth of instructional equipment from very competitive NSF grants. These funds, along with state funds, have assisted in this redesign. The central theme in every case is to develop hands-on discovery type experiments rather than a cookbook "fill in the blank" approach.

3. **Student Quality**

There are no single capstone courses in chemistry to measure student quality. The performance of our students in graduate school, professional schools and in places of employment is monitored

closely. In all cases, we find that our students excel in comparison to graduates from other institutions. Another measure of the quality of our product is the fact that 70-75% of our students are in graduate school with most pursuing a Ph.D. degree. Most of these students in graduate school were awarded excellent, fully-funded fellowships to pursue their work. We have a difficult time scheduling all of those universities that desire to give a seminar to recruit our students. Students that just have an average GPA are still recruited extensively because other schools know the reputation of our undergraduates and master's program in chemistry.

In Forensic Science, most of the students go directly to work in crime laboratories after receiving their B.S. degrees. Dr. McGee, the Director of our Forensic Science program, keeps in close contact with the employers of these students in order to properly gauge the effectiveness of the forensic program at UCF. At this point in time the reviews have been very positive. Dr. McGee is in the process of updating his program to include more on the very important techniques related to DNA testing.

3. ANALYSIS OF GRADUATE PROGRAMS

A. Student Enrollment

1. Headcount for Students Enrolled in the M.S. Industrial Chemistry

1989-90	1990-91	1991-92	1992-93	1993-94
29	26	30	24	30

The enrollment in our Master of Science program in Industrial Chemistry has remained relatively constant for the past five years. The primary reason for this is due to a limitation of resources. In order to increase numbers significantly, the department would need a greater number of GTA and GRA stipends, increased expense budget, and more faculty.

2. Distribution of Courses Offered

The distribution of courses offered is shown in the following table:

Master's Level Course Offerings

	1991		1992		1993		1994	
	Lec	Lab	Lec	Lab	Lec	Lab	Lec	Lab
Summer	1	1	0	0	1	0	1	0
Fall	4	0	4	0	3	0	4	0
Spring	2	0	4	0	3	1	5	1

There has been no significant change in the distribution of courses offered in the last five years. Starting in 1990, additional course options were added and some courses were consolidated, based upon an analysis of student need. In addition, to improve our efficiency, some of the optional courses were placed in an "every other year" rotation.

B. Program Productivity Trends (Over past 5 Years)

1. Student Credit Hour Production

Student credit hour productivity increased steadily to 1992 and has dropped slightly in 1992-93 due to a decrease in the number of GTA's. There was an increase of 31% in 1993-94 primarily due to an increase in the number of GTA's and GRA's.

M. S. Student Credit Hour Productivity

1990-91	1991-92	1992-93	1993-94
182.00	250.00	208.00	273.00

During the next year, it is expected to remain at the 1992-93 level. Increases beyond 1993-94 will depend on level of support.

2. Number of Graduates

The following table depicts the number of graduates in our M. S. program in Industrial Chemistry:

Number of M. S. Graduates

1990-91	1991-92	1992-93	1993-94
5	4	5	3

The drop seen in 1993-94 is due to the decreased number of GTA's in 1990-91 and 1992-93. The number of graduates is expected to rise to the level seen in 1992-93 since the number of GTA's and GRA's has been increased to the level in 1990-91. The major limitation is to further increases in GTA and GRA support.

C. Program Quality

1. Demand for Program

The demand for our program has always far exceeded the number of available slots, especially from international graduate students. The number of quality applicants to the program remains high. However, this is not expected to continue unless we stay competitive in GTA stipends. We have kept the number of international students limited due to the fact that we require a demonstrated capability to converse well in the English language for GTA's. The second major limitation in increasing enrollment is the number and level of graduate teaching and research stipends. Good students are sought after by graduate schools and GTA and GRA stipends offered by many schools far exceed our stipend offer. Our current level was increased to $10,000 in 1992 while the national range is from $12,000 - $15,000.

2. Student Support

Graduate Students

During the past year, seven GTA's were supported from E&G funds in the fall, ten in the spring, and three in the summer of '93. Five GRA's were supported by C&G funds in the fall, six in the spring, and five in the summer. The current level of support for GTA's and GRA's is $5000 for fall and spring and $3,300 for the summer.

Undergraduate Students

One undergraduate student was paid from E&G funds for the year. Fifteen undergraduate students were paid from C&G funds in the fall, ten in the spring and seventeen in the summer.

Fellowships

One graduate student received a Fellowship from the National Science Foundation for the academic year.

Summary of GTA's and GRA's

Category 1993 - 1994	Student Level	Average Number 1993-1994	Average Paid Per Student/Per Term
E&G Funds	Graduate (GTA's)	10	$5,000
	Undergraduate	1	$7,280 (Year) *
C&G Funds	Graduate (GRA's)	6	$5,000/Term
	Undergraduates	14	$2,080/Term **
Fellowships & Other	Graduate	1	$22,500

* Based on $7.00 an hour @ 20 hours per week.

** Based on $6.50 an hour @ 20 hours per week.

3. Program Standards

The Graduate Record Examination (GRE) is required of all graduate students. Minimal requirements for admission include a grade point average (GPA) of 3.0 for the last 60 semester hours of undergraduate study or a score of at least 1000 on the combined quantitative-verbal sections of the General Aptitude test of the GRE. In addition, the Departmental evaluation relies on letters of recommendation. Proficiency examinations are given to all incoming graduate students. The results of these exams are used in planning the student's program of study. Deficiencies may require remedial course work.

The minimum semester hours required for graduation is 30 and a minimum GPA of 3.0. All students have a committee of at least three faculty members for program planning who are also responsible for the final oral exam. All students are required to submit a thesis on their research, present an oral defense, and answer any questions presented by the student's program committee and any faculty member. The faculty committee members will cast

a "pass" or "fail" vote and will design the remedial work required if failure does occur.

All students are expected, with the help and co-authorships of their major professor, to present their work for publication in refereed publications. In addition, they are encouraged to present their work at national or regional professional meetings. Appendix IV shows many publications and presentations co-authored with students.

4. Student Quality

Over the past five years, students have had an entry GPA average of approximately 3.14 and a GRE of 1067. Current students follow approximately the same trend. There are no professional exams other than the GRE for entering students, and the measures of quality are those discussed in the last section for graduation requirements. Since we are not a large program, we are able to keep in contact with most of our graduates and their employers. Uniformly, the comments about our graduates concerning their preparation for further study or work is extremely positive. Similar positive comments are made by the employers. We take these comments very seriously, and where needed, make the necessary program improvements. We are beginning an Industrial Affiliates Advisory Board to give advice about our B.S. and M.S. programs. Many of the first group in our Advisory Board will be from those employers already employing our graduates. Our first preliminary meeting included representatives from Shell; Schering/Plough; Rhone-Poulence Rorer; Post, Buckley, Schuh & Jernigan; Bionomics; Bionetics; and the Florida Solar Energy Center.

4. RESEARCH AND SCHOLARLY ACTIVITIES

A. Scholarly Productivity

1. Trends in Scholarly Productivity (Over Past Four Years).

There were 28 publications in regional, national or international in 1990-1991, 24 in 1991-1992, 31 in 1992-1993 and 31 in 1993-94. For each of those years, the percentage of faculty involved in publication was 65% to 70%. The number of presentations for regional, national or international meetings was 27 for 1990-1991, 31 for 1991-1992, 27 for 1992-1993, and 33 for 1993-94. Lack of sufficient departmental support for travel has had a detrimental effect in the number of presentations. Each year 60% to 65%

of the faculty were involved in the presentations. In addition to the presentations listed above, faculty members presented 15 to 20 seminars at universities and companies. These are summarized in the Appendix.

Number of Faculty Publications and Presentations

1990-91		1991-92		1992-93		1993-94	
Pubs.	Prcs.	Pubs.	Prcs.	Pubs.	Prcs.	Pubs.	Prcs.
28	27	24	31	31	27	31	33

2. External Funding

The level of external funding has been expanding significantly since 1990-91, at which time it was at the $300,000 level, approximately $700,000 in external funding in 1991-92, $800,000 in 1992-93, and $1,124,861 in 1993-94. The increase for 1993-94 over 1992-93 was 39% and marks the first time we have exceeded one million dollars in external funding. I doubt there are many departments that have reached this level. In each of the last three years, 70% to 80% of the faculty have received external funding. In 1993-94, 78% received funding.

One of our faculty members who is not funded is on phased retirement and a second one is returning to the faculty after being in administration for the past fifteen years. A third faculty member has not been research active for the past ten years. A list of external grants received is listed in the below table.

New Funding and Funding Listed on Attachment 7

Principle Investigator	Amount	Funding Agency	Award Date	Title
Beck, K.	$3,000	Hutchings Technology	1994	Development of Photoacoustic Detection System
Beck, K.	$3,000	Unilever, Ltd. (Netherlands)	1994	CUR-ERAMUS/Student Exchange Program
Beck, K.	$14,000	Research Corp.	94-95	Dissociation of Perylene-CO
Cerqua-Richardson, K.	$54,000	University/Rochester	7-1-93	Manufacturing Science of Infrared Materials
Cerqua-Richardson, K.	$15,000	National Research Council/CAST	12-93	Processing of IR Waveguides
Cerqua-Richardson, K.	$32,000	University/Rochester	3-1-93	Optics Modernization Program
Clausen, C.	$40,000	NASA	2-1-94	Water Rinse to Determine the State of Cleanliness of a Surface - Phase V
Clausen, C.	$16,120	Engineering Technology	8-30-93	Catalytic Production of Carbon Filaments
Clausen, C.	$17,120	Engineering Technology	8-30-93	Conductive Polymer Filaments
Clausen, C. (Co-PI)	$82,506	Gulf Coast Hazardous Research Center	5-1-94	Innovative Methods for Removal of Residual Carbon Monoxide and Nitric Oxide in Exhaust Gases from Hazardous Waste Incinerators, II
Cunningham, G.	$4,000	Glaxo Chemical	5-1-93	Stability of a New Anti-Cancer Drug
Cunningham, G.	$5,000	American Cancer Society	5-10-94	Student fellowships (2 @ $2,500 each) to conduct cancer research in Cunningham's lab.
Elsheimer, S.	$1,485	Florida-Poland Program	2-1-93	Fluorinated Uracil Derivatives
Gupton, J.	$11,500	Cyanamid	1-1-93	American Cyanamid Research Program
Gupton, J.	$8,500	Cyanamid	1-1-94	American Cyanamid Research Program
Gupton, J.	$39,283	Gulf Coast Hazardous Research Center	5-1-93	Chemical Degradation of Unsaturated Priority Pollutants by Treatment with Mixed Oxidizing Agents
Gupton, J.	$15,000	Ciba Geigy	5-94	Giba-Geigy Research Program

Hampton, M. (Co-PI)	$12,000	NASA	8-15-93	Undergraduate Student Researcher Program
Madsen, B.	$12,000	Bionetics Corp/NASA	7-93	Characterization and Evaluation of Acid Rain at a Site Remote from the Kennedy Space Center
Madsen, B.	$12,000	Bionetics Corp/NASA	12-1-93	Characterization and Evaluation of Acid Rain at a Site Remote from the Kennedy Space Center
Mattson, G.	$102,000	Constar International	4-1-94	Pet Viscosity
McGee, W.	$5,000	Analytical Services Co.	11-93	The Use of Presentation Software in the Development of Electronic Laboratory Experiments
Miles, D. H.	$80,000	Sterling Drug Co.	7-1-93	Pharmaceuticals from Peru Plants
Miles, D. H.	$380,000	USAID/HEDS	6-1-93	Higher Education Development Support Project
Beck, K.	$8,041	UCF/DSR	11-8-93	Beck Balance
Clausen, C.	$9,482	NSF	9-15-93	Grad Fellowship FY-93 - Minority
Clausen, C.	$12,014	Engineering Tech	10-19-93	Catalytic Production of Carbon Filaments
Clausen, C.	$20,916	UCF/DSR	11-8-93	Aerosol Balance
Clausen, C.	$13,014	Engineering Tech	10-19-93	Conductive Polymer Filaments
Clausen, C.	$28,369	NASA	1-28-94	Water Rinse to Determine Cleanliness II
Cunningham, G.	$1,713	Various/Internal	2-11-94	Lab Cost/Recovery
Elsheimer, S.	$555	Sparton Electronics	3-22-94	Sparton Expense Support
Gupton, J.	$8,500	Cyanamid	11-17-93	Ag. Synthesis
Gupton, J.	$15,000	CIBA-GEIGY	1-6-94	Synthesis of Potential Pyrrole Agrochemicals
Madsen, B.	$8,576	Bionetics	1-10-94	Characterization of Acid Rain in East Central Florida
Miles, H.	$34,167	Sterling Drug, Inc.	12-1-93	Pharm. Peru Plants
	1,124,861.00			

3. **List of Scholarly Activities (Current Year)**

   a. **Publications**

   b. **Presentations**

   c. **Creative Activities (Performances, Exhibits, Commission, Productions, Etc.)**

   d. **Student publications, presentations and creative activities not listed in faculty lists.**

See appendixes for all of the above.

5. INTERNATIONALIZATION OF PROGRAMS

A. Analyze the International Focus of Department (Relative to Last Year)

Currently, we have one faculty member, Dr. Howard Miles, who is the long term chemistry program advisor to Indonesia. This is part of a large USAID grant which includes one other faculty from UCF and several from FSU. Dr. Gupton had a student exchange program with The Netherlands, one of his students is currently doing research in The Netherlands, and one of their students is at UCF. Dr. Seth Elsheimer submitted a cooperative grant with a Polish university faculty member, to NSF, which was not funded. Dr. Clausen gave several lectures in Norway, Ireland and Mexico. Dr. Cunningham has one B.S. student in study from Sweden. Dr. Cunningham also hosted University leaders from Sweden, Indonesia and Brazil in 1993-94.

In our graduate program, one-third of our current M.S. students are international students representing Jordan, China, Indonesia, Korea, Taiwan, India, Canada and Iran.

6. CULTURAL DIVERSIFICATION

A. Analyze Cultural Diversification of Department

1. **Departmental Activities Relative to Recruitment, Enrollment, Retention, Graduation, and Hiring of Minorities; Plans for Diversification:**

The Department of Chemistry, in conjunction with CREOL, added an outstanding faculty member to the department in May, 1993, Dr. Kathleen Cerqua-Richardson. Dr. Richardson is a

Materials Chemist. She is an outstanding scientist and is the first woman faculty member in the Chemistry Department. We have made offers to minority faculty and women in the past, but have never been able to offer sufficient salary.

A search committee was formed in our department in 1993-94 with Dr. Kenneth Beck as Chair. The purpose of this committee was to allow us to expand our pool of minority candidates. Letters were written to most graduate programs across the United States indicating our desire to add minority faculty members to the Department. Numerous other listings of minority candidates for faculty positions were utilized. The search committee narrowed the list of minority candidates and presented them to the faculty. From that list, two were selected for visits and interviews. Both candidates, Dr. Jorge Castillo and Dr. Harry Price, proved to be excellent potential faculty members. Dr. Price, an African American, possessed the capabilities most needed by the Department. The Department faculty voted unanimously to hire Dr. Price. An offer letter has been sent to Dean Sheridan for approval before transmitting an official offer to Dr. Price.

Currently, of our 37 graduate students, 17 are women, and 20 are international students representing five different countries. In our graduate program, we are adding significantly to the very limited pool of women chemists and expect to continue to increase that pool.

In our office staff, we added two black women students who served as part-time typists-receptionists from the work study program.

Any further increase in diversity of the Department will depend on position availability. We will make every effort to continue diversity in our faculty. In the next two years, it is expected that we will hire three new faculty members.

2. **Curricular Efforts Related to Diversity**

Our curriculum, which is certified by the American Chemical Society, has little room for changes. Any diversity issues would be covered in the GEP program.

7. PARTNERSHIP ACTIVITIES

A. Analyze Partnership Activities of Department (Relative to Last Year)

The Department of Chemistry has always been very active in partnership with public agencies and private companies as can be seen from the list of external sources of funding (item number 4). Our activities in this area are summarized below.

a) Industrial Affiliates Advisory Panel - a preliminary planning meeting was held on May 28 with representatives of six local and national companies. Funds were requested from the Strategic Planning Institute Awards program, but were not awarded. We have continued with our plans to form the Industrial Affiliates Advisory Panel. The panel is so important to our program that we plan to include it as a high priority item in our budget this year.

b) The Chemistry Department is actively working with the Florida Hospital's Walt Disney Memorial Cancer Institute to form a cooperative research team to focus on cancer and related diseases. This team effort could be a conduit to cooperative ventures with national pharmaceutical firms and the National Cancer Institute. The Walt Disney Memorial Cancer Institute will be a part of our development of the Institute for Drug Development and Innovative Therapies.

c) Cooperative research ventures were instituted or continued with many major firms and agencies. These are listed below:

<u>Major Firms:</u>

1) Monsanto Company
2) Ciba-Geigy Corporation
3) American Cyanamid Company
4) Sparton Electronics
5) S & H Fabricating and Engineering Corporation
6) Glaxo Chemicals
7) Nephrone Pharmaceuticals
8) Engineering Technology
9) Bionetics Corporation
10) Constar International

Agencies:

1) National Science Foundation
2) National Institutes for Health
3) Research Corporation
4) Gulf Coast Hazardous Substance Center
5) National Aeronautics and Space Administration
6) The American Cancer Society - Florida Division
7) The Dreyfus Foundation
8) The Petroleum Research Fund
9) Naval Research Laboratories
10) Department of Defense

8. OTHER DEPARTMENTAL ACCOMPLISHMENTS

A. Symposia, Conferences, Lecture Series Sponsored

1. **Clausen, C. A.** - Conducted a workshop, "Reduction of Automobile Exhaust Emissions by use of Deposit Control Additives." Mexican Petroleum Institute, Mexico City, Mexico. October 20, 1993.
2. **Cunningham, G. N.** - Chair and organizer of 18th Annual American Cancer Society Research Seminar-Symposium with two national speakers, 32 research presentations, 12 poster sessions and 175 people in attendance. Radisson Airport, Orlando, FL. March, 1994.
3. **Gupton, J.** - Chair and organizer of the 12th Florida Organic Chemistry Faculty Conference, UCF Campus, Orlando, FL.
4. **Gupton, J.** - Organizer of workshops on grant funding. CUR Conference, Lewiston, Maine. June, 1994.

B. Innovations or New Programs

1. **Ph.D. program planning** - A committee was formed in 1993 to plan for a new program for 1997-78. Goals were established, areas of focus were agreed upon by the department, and curriculum planning was begun.
2. **Institute for Drug Development and Innovative Therapies** - The Chemistry Department is the home department for this proposal institution and played a major role in writing the document that was submitted to SUS for funding considerations.

C. Quality Improvements

1. A new inorganic laboratory course for chemistry majors was added in 1992. This new course was required by the American Chemical Society Committee on Program Accreditation. The Departmental faculty agreed with this inclusion and felt it adds a needed area of laboratory emphasis.
2. Modification of a graduate course on the chemistry of materials was made to take advantage of the talents and training of our new faculty member, Dr. Kathleen Richardson. Dr. Richardson has a superb background in glass, aromics and in studying the property of materials.

D. Accomplishments of Centers and Institutes

No centers or institutes are currently housed in the Chemistry Department.

E. Continuing Education Program

None

F. Progress Toward Creating a Departmental Planning Process

The Chemistry Department has always operated with a strong committee structure which operates with some initial charges from the Department Chair and then are asked to develop specific goals and action plans with respect to the charges from the Chair or from general faculty meetings along with other items they deem appropriate in their deliberations. The following committees were active during this past year:

1. Undergraduate Affairs Committee
2. Graduate Affairs Committee
3. Research Committee
4. Instrumentation Committee
5. Teaching Committee
6. Ph.D. Planning Committee
7. OCO Committee
8. Alumni Relations Committee
9. Student Awards Committee

These committees regularly report to the Chair and in Departmental faculty meetings. At least once a year, a planning session is held in which each committee makes its report and the reports are agreed upon by the Department or sent back to the committee for more study before returning

with recommendations which are always presented at faculty meetings. The current SACS report is a result of some of the planning sessions.

G. **Other Noteworthy Accomplishments**

Dr. Christian Clausen - served as a consultant for several firms and for the State on hazardous waste.

Dr. Glenn Cunningham - named to the SACS review panel for Texas A & M University, Kingsville, Texas. At that institution, he conducted and prepared written reviews of the Biological Sciences, Chemistry, Geosciences, Mathematics and Physics.

Dr. Glenn Cunningham - reviewed several grant proposals from the American Cancer Society and served on the ACS Florida Research Committee. He also reviewed grant proposal for The Research Corporation.

Dr. Seth Elsheimer - wrote reviews on five textbooks and reviewed three proposals for the Petroleum Fund of the American Chemical Society.

Dr. John Gupton - served as a referee for the Journal of Heterocyclic Chemistry, Journal of Organic Chemistry, Synthetic Communications, Tetrahedron, and Tetrahedron Letters.

Dr. John Gupton - also served as a reviewer for the National Science Foundation, American Chemical Society PRF and The Research Corporation.

Dr. Michael Hampton - served as Chair of the College and High School Mentor Selection Committee, U.S. National Olympiad and a member of the International Chemistry Olympiad.

Dr. Michael Hampton - was appointed as National Councilor to the American Chemical Society for 1993 - 1996.

9. PLANS AND GOALS OF DEPARTMENT

A. Summary and Implication of Above

The enrollment growth in Chemistry classes (33% increase in FTE production over 1992-93) was the greatest since the start of the Chemistry Department in 1968. Since the size of the teaching faculty is almost the same as it was in 1972, our ability to deal with these numbers has been stretched to the limit. Our department has always placed a high priority on teaching and the large increase in student - teacher ratio makes it very difficult for faculty to give quality individual attention. The high demand for lecture classes results in a similar

demand for laboratory courses. Because of space and safety concerns, laboratory courses are limited to 18 to 24 students per section, and are expensive in comparison to lecture courses because of the requirement for supplies and instrumentation. Our department realizes the importance of increasing the enrollment of the University and the results of last year's increase in FTE's clearly demonstrates that we have done our part. In order to continue to provide greater access to lecture and laboratory courses, resource needs in terms of faculty, staff, GTA's, equipment and expense must be addressed.

As reported earlier in this document, this department has made significant research contributions to the University with a milestone of over $1,000,000 in external funds in 1993-94. Even when our faculty have been faced with significant increases in teaching loads, they have still presented professional papers, written grant proposals, written articles which were published in professional journals, formed partnerships with industry, received funding from national agencies and companies, and directed the research of graduate and undergraduate research students. The Department of Chemistry has always maintained that active research is no better place to teach chemistry than in the research laboratory. This productivity is also being stretched to the limit by the increased demand without proper resources.

Significant progress is being made in increasing the diversity of the department. One faculty, Dr. Kathleen Richardson, was added in 1993 and our faculty Minority Committee developed a sufficient pool of excellent candidates from which individuals were interviewed, and as a result, an offer to a minority candidate is being made pending approval from the Dean.

B. Evaluation of Primary Accomplishments

Some of the primary accomplishments are discussed in part A.

(1) Provided significant access to Chemistry classes as can be seen in an increase in FTE's and majors in Chemistry and Forensic.

(2) Continued to have significant number of presentations, publications and funded grant proposals.

(3) Made progress in the diversity area in that two minority faculty were interviewed and an offer will be made to one of them (pending approval from the Dean).

(4) Significant progress was made in forming a working relationship with Florida Hospital's Walt Disney Memorial Cancer Institute. Four of these faculty were given affiliated appointments in Chemistry and one a tenure earning line in Chemistry.

(5) Reached agreement internally on plans and format for a Ph.D. program.

(6) Submitted plans for an Institute for Drug Development and Innovative Therapies which would be housed in the Chemistry Department and would include faculty from several areas.

(7) Faculty made significant contributions to their respective fields as reviewers of grant proposals and journal articles; organizers and presenters of symposiums, and service on evaluation panels.

C. **Projections and Goals for Next Year**

1. **Increase Access to Chemistry Classes**

We plan to work with the administration to attain resources sufficient to provide access to Chemistry lecture and laboratory courses with quality instruction.

2. **Formation of Industrial Affiliates Advisory Group**

Plans were submitted in 1993-94 to the Strategic Planning Grants Innovative program for funding. However, the reviewers apparently felt that forming partnerships with industry was not one of the President's Five Goals, and was not important (this was actually stated by one reviewer). Forming partnerships is one of the President's Five Goals. We think the formation of the Industrial Affiliated Advisory group is so important to our Department that funding will be built into this year's Departmental budget for this purpose. Funding and support of research is becoming increasingly difficult from national agencies and it appears departments are going to increasingly depend on contracts with industry. A functioning Industrial Affiliated Advisory group will help ensure an increase in our funding. We have already had a preliminary meeting with representatives of some companies and have detailed plans for implementation in 1994-95.

3. **Formation of the Institute for Drug Development and Innovative Therapies**

Members of the Chemistry Department have been interested in beginning an Institute for Drug Development for over two years. This effort has been expanded to include innovative therapies by inclusion of several scientists with Florida Hospital's Walt Disney Memorial Cancer Institute. Several meetings have been held to put this proposal together and it has been submitted to the President's office and presented to the State University System's (SUS) office for possible funding. This new Institute should provide a strong base for new research funding and also be of assistance in acquisition of a Ph.D. program.

4. **Faculty Additions and Diversity**

The Department has interviewed two minority candidates and has an offer letter ready for one candidate pending approval from the Dean of Arts and Sciences. The Department believes this candidate will be an excellent faculty member and will do everything within reason to get this individual hired. In addition, it is expected that we will initiate searches for two additional faculty to replace faculty who are leaving UCF. Again, the Department will encourage minority applicants to apply.

5. **Ph.D. Program Planning**

We will continue with our plans for a Ph.D. program and plan to have a proposal ready to present to higher administration by the end of the 1994-95 academic year.

6. **Improving Instruction by Graduate Students**

A more formal training program will be conducted for GTA's in order to better prepare them for their instruction responsibilities in laboratories and discussion sections. We will be developing the formal plan during this next academic year to supplement our current instructions of teaching assistants.

7. **Successfully Complete External Reviews of the Department**

A review of the Department will be conducted as part of SACS review for reaccreditation of UCF and also as a part of the

Physical Sciences Review conducted by the State University System. An extensive document has already been prepared for the SACS review and it is expected that most of that document will be used for the external SUS review.

A review of B. S. curriculum and support structure was conducted by the American Chemical Society in 1993-94 and results of the accreditation review should be available in the fall of 1994-95.

8. **External Funding Efforts**

The Department will strive to maintain a high level of external research funding and scholarly productivity. Sections 4.1 and 4.2 are concrete evidence of our past and present success in both of these areas. We feel that teaching and research are mutually beneficially and are committed to a high level of productivity in funded grants and peer reviewed publications.

9. **Modernization of Instrumentation and Increasing the Department's Instrument Capability**

Since Chemistry is a laboratory science, we must stay current in our holdings of modern instrumentation. These instruments are crucial for our research and teaching efforts. The State has not contributed significantly to the OCO budget for some years and, in addition, our University has chosen to turn the equipment dollars in additional sections of classes. This may not impact the College of Business or many departments in the College of Arts and Sciences, but is does have a major impact on Chemistry. The Department has done a lot to alleviate that with matching grants, gifts, etc., and acquired significant instruments two years ago during the renovation. Funding for instrumentation is increasingly difficult from federal agencies, and if the University is desirous of becoming a modern research and teaching institution, a commitment must be made to increase OCO funding.

10. **Increasing Funding - Forensic Science Program**

Increasing funding for our Forensic Science program to take care of growth and to modernize the curriculum is important to meet student and employer needs.

Four years ago the number of Forensic Science majors had dropped to 12 majors. This year, the number of majors increased to 60. With the interest we have seen this summer in Forensic Science as a major, I expect an expansion of at least 80 by the fall of 1994. This increase means we will be required to increase the course offering by hiring suitable adjuncts in addition to our permanent faculty. Currently, one faculty member, Dr. William McGee, is responsible for this entire program.

Changes in the field of forensic science dictates curriculum changes. This is especially true with emphasis on the methodology and technology associated with DNA sequencing. Dr. McGee has outlined an outstanding new curriculum to allow students an option to pursue the more molecular biology-biochemical approach to forensic science. These changes will be expensive and will require a University commitment. We are pursuing an Advisory Committee to help pursue funding from the DNA Identification Act of 1993 which is part of a federal crime bill.

The Forensic Science program at the University of Central Florida is the only one in the Southeast and renders a valuable service to the state and nation. The program must be supported if it is to supply trained forensic scientists who are capable of critical thinking. The program must be modernized to remain current with a dynamic field.

DEPARTMENT OF CHEMISTRY

ANNUAL REPORT APPENDIX

1993-94

I. Manuscripts Published

II. Presentation of Professional Papers

III. Other Scholarly and Creative Activities

IV. Student Publications

V. Lab Request for Chemistry

Annual Report
Chemistry Department
1993-94

APPENDIX

RESEARCH AND SCHOLARLY ACTIVITIES - FACULTY

I. Manuscripts Published

Bergink, J.M., Claudio, V., and Beck, K. (April, 1994). "Vibrational Excitation and Dissociation Dynamics in Perylene-CO." Journal of Physical Chemistry. New York. International.

Silfvast, Bender and Beck. (December, 1993). "Investigation of the Distortion and Damage of Mo-Si Multilayer Reflective Coatings with High Intensity Radiation." Applied Optics. Front page. International.

Furlan, A., Troxler, and Leutwyler, S. (1993). "Pyrene-Rare Gas Complex Molecular Dynamics." Journal of Physical Chemistry. 97, 13527. International.

Hari, P., Taylor, P. C., and Cerqua-Richardson, K. A. (1994). "Nuclear Quadrupole Resonance Studies of As_2Se_3 Fiber." Physical Review. International.

Cerqua-Richardson, K. A., Darab, J. G., MacCrone, R. K., and LaCourse, W. C. (1993) "Observation of draw-induced defects in As-Se Glass Fibers by Electron Paramagnetic Resonance." Journal of Non-Crystalline Solids. International.

Cerqua-Richardson, K. A., LaCourse, W. C., and Thiebaud, J. E. (1993). "XPS as a Structural Probe of Tex Glasses." Journal of Non-Crystalline Solids. International.

Peng, B., Izumitani, T. and Cerqua-Richardson, K. A. (1993). "Spectroscopic Investigation of Cr^{+4} Doped Silicate and Aluminate Glasses." Journal of the Japanese Ceramic Society. International.

Cerqua-Richardson, K. A., Shieh, M. and LaCourse, W. C. (1993). "Forming-Induced Structural Changes and their Effects on Chalcogenide Glass Fibers." J\Physics of Non-Crystalline Solids. London.

Cerqua-Richardson, K., Schmidt, S. L., Czjacowski, O., Vakiner, J. and Platt, G. (January, 1994). "Automated Manufacturing Expands to the Infrared." Laser Focus World, vol. 30 (1). International.

Martinez, A., Geiger, C., Hewett, M., Clausen, C. A. and Cooper, C. D. (1993). "Using Hydrogen Peroxide or Ozone to Enhance Incineration of Volatile Organic Vapors." Journal of Hazardous Waste Management. Vol. 13, 261-269. International.

Clausen, C. A., Duan, X. Y., Morgan, P. W., Jenkins, L. and Resetar-Racine, T. M. (1993). "Synthesis and Properties of Potential Multispectral Screening Materias." Proceedings of the Smoke/Obscurants Symposium XVII. 511-523. International.

Geiger, C., Martinez, A., Clausen, C. A. and Cooper, C. D. (1993). "Using Hydrogen Peroxide or Ozone as a Possible Method to Improve Destruction Efficiency for Hazardous Waste Incinerations." Journal of Hazardous Waste Consultant. International.

Kokpol, U., Chavasir, W., Chittawong, V., Bruce, M., Cunningham, G. and Miles, D. H. (1993). "Long Chain Aliphatic Alcohols and Saturated Carboxylic Acids from Heartwood of Rhizophora Apiculata. Phytochemistry, 33, 1129-1131. International.

Cunningham, G.. (June, 1994). "Undergraduate Research in Biochemistry at UCF." Council on Undergraduate Research Quarterly. Vol. 14, 179-183. International.

Kirkham, J., Cunningham, G. and Daneshmand, K. (1994). "Stability of Danestron in a Total Hyperal Solution." Journal of Hospital Pharmacy.

Elsheimer, S. (1994). "The Chemistry of Organic Fluorine Compounds, First Supplement, ACS Monograph 187." American Chemical Society Books. Chapter. International.

Gonzalez, J., Foti, M., Elsheimer, S. (1993). "3,3-Difluoroallyltrimethylsilane." Organic Syntheses. 72, 245. International.

Gupton, J., Hicks, F., Smith, S. Main, D., Wilkinson, D., Petrich, S., Silorski, J. and Katritzky, A. (1993). "The Preparation and Some Reactions of a Benzotriazole Substituted Vinamidinium Salt." Tetrahedron. 49, 10205. International.

Gupton, J., Hicks, F., Wilkinson, D., Petrich, S. and Sikorski, J. (1994). "The Preparation of Thiophene Appended Vinylogous Iminium Salts and their Application to the Regioselective Synthesis of Thienylpyrimidines and Thienylpyrroles." Heterocycles. 37, 487.

Wood, G. L., Tillman, C. and Hampton, M.D. (March, 1993). "Synthesis of 1,1,1,3,3,3-hexachloro-2,4-isobutylcyclodiphosphaz(V)anecyclodiphoshpazane. An Inorganic Experiment." Journal of Chemical Education. International.

McCann, M. P. and Hampton, M. D. (April, 1994). "Detection of Molecular Hydrogen by Stimulated Raman Emission." Applied Spectroscopy. April issue. International.

Hampton, M. (1994). "Test Bank to Accompany Chemistry the Central Science by Brown, LeMay and Bursten." Prentice-Hall. National.

McGee, W. W. and Mattson, G. (1993). "The Use of an Electronic Spreadsheet in the Design of Exercises for a Polymer Laboratory." Journal of Chemical Education. Vol. 70, 756.

McCann, M. P., Chen, C. H., Datskou, I. and Evans, S. (1993). "Two-Photon Spectroscopy of Molecular Oxygen." Chemical Physics. 174, 417-424. International.

McCann, M. P. and Chen, C. H. (September, 1993). "Ultrasensitive Analysis of Gases using Laser Spectroscopy." American Laboratory. 46-52. National.

Szczubialk, K., Adcock, H., Perkins, C., Strickrod, R. and McCann, M. P. (March, 19940. "Two-Photon Spectroscopy of Nitric Oxide." Applied Spectroscopy. National.

Thompson, C. M. and McGee, W. W. (1994). "Gel Permeation Chromatographic Analysis of Polyurethane Prepolymer synthesis Kinetics II. The Effects of Stoichiometry and Type of Diisocyanate." Journal of Polymer Science. 32, 113-120.

Thompson, C. M. and McGee, W. W. (October, 1993). "Development of a Materials Specification for Polyethylene to be Used with Transducers, Cables and Splices: Off-Specification Studies." Department of the Navy. Washington, DC.

Miles, D. H., Tunsuwan, K., Chittawong, V., Kokpol, U., Choudhary, M. I. and Clardy, J. (1993). "Boll Weevil Antifeedants from Arundo donax." Phytochemistry. 34 and 35, 1277. International.

Miles, D. H., Tunsunan, K., Chittawong, V., Hedin, P. A., Kokpol, U., Ni, C. Z. and Clardy, J. (1993). "Agrochemical Activity and Isolation of N - (4'-Bromophenyl) - 2,2 - Diphenylacetanilide from the Thai Plant Arundo donax." Journal of Natural Products. 56, 1590. International.

Miles, D. H., Chittawong, V., Hedin, P. A. and Kokpol, V. (1993). "PotentialAgrochemicals from the Leaves of Widelia biflora." Phytochemistry. 32, 1427. International.

II. Presentation of Professional Papers:

Bergink, M., Claudio, V., Beck, Kenneth. (May, 1994). "Vibration Excitation and Pre-Dissociation Dynamics in Perylene-CO." Florida American Chemical Society. Orlando, FL.

Enriques, A., Clausio, V., Prenitzer, B., Beck, Kenneth. (February, 1994). "From Weakly Bound Complexes to Technology Transfer." University of Illinois at Chicago. Chicago, ILL.

Bergink, M., Claudio, V., Beck. Kenneth. (February, 1994). "Vibrational Excitation and Pre-Dissociation Dynamics in Perylene-CO." University of Chicago. Chicago, ILL.

Bergink, M., Claudio, V., Beck, Kenneth. (September, 1993). "Vibrational Excitation and Pre-Dissociation Dynamics in Perylene-CO." University of South Florida. Tampa, FL.

Cerqua-Richardson, K. A., Villeneuve, A. and Qian, S. (April, 1994). "Processing and Development of Chaglcogenide Glass Films for Nonlinear Applications." American Ceramic Society Annual Meeting. Indianapolis, IN. International.

Cerqua-Richardson, K. A. (April, 1994). "Engineers in Education: What do you Bring to the Classroom." American Ceramic Society Annual Meeting. Indianapolis, IN. International.

Cerqua-Richardson, K. A., Schmidt, S., Vakiner, J. and Platt, G. (July, 1993). "Development of a Comprehensive Infrared Material Database for the Optical Fabrication System." SPIE Annual Meeting. San Diego, CA. International.

Cerqua-Richardson, K. A., LaCourse, W. C. and Thiebaud, J. (July, 1993). "XPS as a Structural Probe of Tex Glasses." 12th University Conference on Glass, Alfred University. Alfred, NY. International.

Richardson, K. A., Darab, J. and LaCourse, W. C. (July, 1993). "Observation of Draw-Induced Defects in As-Se Glass Fibers by Electron Paramagnetic Resonance." 12th University Conference on Glass, Alfred University. Alfred, NY. International.

Clausen, C. A., Geiger, C. and Cooper, C. D. (January, 1994). "Innovative Methods for Removal of Residual Carbon Monoxide and NOx in Exhausts Gases from Hazardous Waste Incinerators." Annual SAC/IAC Meeting. Beaumont, Texas. International.

Clausen, C. A., Cooper, C. D., Geiger, C. L. and Kasper, J. (March, 1994). "Enhanced Incineration Using Hydrogen Peroxide or Ozone - Effectiveness on VOC's and NOx." Symposium on Priorities in Pollution Prevention. Beaumont, Texas. International.

Cunningham, G. and Falls, A. (1993). "Anticancer Activity of Highly Functionalized Pyrroles." 17th American Chemical Society Seminar. Orlando, FL.

Elsheimer, S. (May, 1993). "Organofluroine Chemistry at the University of Central Florida." Adam Mickewicz University. Poznan, Poland. International.

Elsheimer, S. (May, 1993). "Organofluorine Chemistry at University of Central Florida." Jagiellonian University. Krakow, Poland. International.

Elsheimer, S. (May, 1993). "Organofluorine Chemistry at University of Central Florida." Polish Academy of Science. Warsaw, Poland. International.

Gupton, J. (July, 1993). "The Application of Vinamidinium Salts to the Regiocontrolled synthesis of Biheterocyclic Systems." Gordon Conference on Heterocyclic Compounds. New Hampton, New Hampshire. International.

Gupton, J. (September, 1993). "The Application of inylogous Iminium Salts to the Synthesis of Highly Functionalized Pyrroles." School of Chemistry, Georgia Institute of Technology. Atlanta, GA.

Gupton, J. (October, 1993). "Chemistry! What Is It? How Do We Study It? Why Do We Do It?" Science Division, Drury College. Springfield, MO.

Gupton, J. (October, 1993). "An Efficient and Convenient synthesis of Chain Lengthened Homologs of the Fungicide Metalaxyl." Southeast American Chemical Society Meeting. Johnson City, TN.

Gupton, J. (October, 1993). "New Applications of Vinylogous Salts in Organic Synthesis." Department of Chemistry, University of South Dakota. Vermillion, SD.

Gupton, J. (March, 1994). "Implementation of the Dreyfus Scholar/Fellow Award at the University of Central Florida." Dreyfus Scholar/Fellow Award Symposium, American Chemical Society National Meeting. San Diego, CA.

Gupton, J. (March, 1994). "A Regiocontrolled Synthesis of 2,3,4-Trisubstituted Pyrroles from Disubstituted Chloropropeniminium Salts." National American Chemical Society Meeting. San Diego, CA.

Hampton, M. (October, 1993). "Hydrogen as an Alternative Fuel." Seminar, Department of Chemistry, Florida Atlantic University. Boca Raton, FL.

Hampton, M. (April, 1994). "Alternative Fuels." Seminar, UCF Learning Institute for Elders. Regional.

Madsen, B. C. (July, 1993). "Chemical Characterization of Some Aerobic Liquids in CELSS." NASA/ASEE Summer Faculty Fellowship Program - Final Project Seminar. Kennedy Space Center, FL.

Madsen, B. C. (October, 1993). "Characterization and Evaluation of Acid Rain in East Central Florida from 1978-1992 and Evaluation of Some Chromatographic/Spectroscopic Results from Leachate Samples from CELSS." Bionetics Corporation. Kennedy Space Center, FL.

Madsen, B. C. (October, 1993). "Acid Rain Monitoring in East Central Florida in 1992 and Chemical Analysis of Leachate Samples from CELSS." Bionetics Corporation. Kennedy Space Center, FL.

Madsen, B. C. (September, 1993). "Chemical Characterization of Some Aerobic Liquids in CELSS." NASA/ASEE Summer Faculty Fellowship Program. 269-300. NASA Grant NGT-60002 Supplement 11: Contractor Report No. CR-194678. Kennedy Space Center, FL.

Mattson, G. (May, 1993). "The Development of a High Modulus Aramide Fiber. Florida Section, American Chemical Society Meeting. Orlando, FL.

Stickrod, R. and McCann, M. P. (1993). "Two-Photon Absorptions in Nitric Oxide." Florida Section of the American Chemical Society Annual Meeting. Orlando, FL.

McCann, M. P. (March, 1994). "Multiphoton Ionization of Molecules in a Supersonic Jet." Department of Chemistry, Florida Institute of Technology. Melbourne, FL.

McGee, W. W. (September, 1993) "Double Variation Methods for the Evaluations of Trace Evidence." Southern Association of Forensic Scientists, Fall Meeting. Charleston, SC.

Miles, D. H. (July, 1994). "The Formation of Chemistry and Industrial Partnerships for the Purpose of Discovery of New Pharmaceuticals and Agrochemicals from Natural Sources." Annual Meeting of the Indonesian Chemical Society. Jakarta, Indonesia.

III. Other Scholarly and Creative Activities

Beck, K., Clausen, C. and Dougherty, M. "Method and Apparatus for Detecting a Leak Utilizing Photoacoustic Spectroscopy." Research conducted at UCF. U.S. Library of Congress, patent pending.

Beck, K. (1993/94). Official host to international science visitors, Dr. Tetsuro Izumitani, Hoya Corporation, Tokyo, Japan and Dr. Nikolai Nikonorov, Vavilov St. Optical Institute, St. Petersburg, Russia.

Cerqua-Richardson, K. A. (June 3,4, 1993). Exhibit of IR process. Center for Optics Manufacturing Industrial Demonstration. Rochester, New York.

Clausen, C. A. (1994). Representative for Chemistry Department, UCF; and presenter at 1994 Southeast Technology Transfer Conference. Presented an overview of personal research efforts and summary of Departmental research endeavors. Orlando, FL.

Clausen, C. A. (October, 1993). Conducted workshop and gave presentation, "Reduction of Automobile Exhaust Emissions by the use of Deposit Control Additives." Mexico City, Mexico.

Cunningham, G. (April, 1994). Invited by Southern Association of Colleges and Schools to be a member of Accreditation Committee at Texas A&M University, Corpus Christi, Texas.

Cunningham, G. (1993). Organized seminar for American Cancer Society. Radisson Airport Hotel, Orlando, FL.

Elsheimer, S. (1993/94). Reviewer (textbooks) for following publishers: William C. Brown, Prentice-Hall, Wiley, Houghton-Mifflin and West Educational Publishers.

Elsheimer, S. (1994). Reviewer of three research grant proposals for American Chemical Society Petroleum Research Fund.

Gupton, J. Referee for following journals and agencies: Journal of Heterocyclic Chemistry, Journal of Organic Chemistry, Synthetic communications, Tetrahedron, Tetrahedron Letters, National Science Foundation, American Chemical Society and Research Corporation.

Gupton, J. (1993/94). Elected Councilor, National Council on Undergraduate Research. One duty as Councilor included organizing the National 1994 CUR Conference.

Gupton, J. (February, 1994). Organized and hosted the Twelfth Florida Organic Faculty Conference. UCF, Orlando, FL.

Hampton, M. D. Reviewer on article, "Simplifying Acid-Base Calculations." Journal of Chemical Education.

Hampton, M. D. (1994). Director of Orlando Section, Chemistry Olympiad and National Chemistry Olympiad. Coordinator of local and national annual events.

Hertel, G. (1994) Developed two computer tasks for annual event, Chemathon.

Kujawa, F. (May, 1993). Slide presentations on "Overview of Florida Geology," "Sinkholes in Florida," and "Beach Processes and Hazards." The Learning Institute for Elders at UCF.

Madsen, B. (1993/94). Consultant, Bionetics Corporation/NASA on acid rain. Kennedy Space Center, FL.

Mattson, G. (1993-94). Reviewer of textbooks for William C. Brown Publishers and Brooks/Cole Publishing Co.

McGee, W. W. (1993-94). Consultant, forensic science. Office of Public Defender, Orange and Seminole Counties, FL; Naval Research Laboratory, Orlando, FL; and Texas Research International, Austin, Texas.

McGee, W. W. (1993-94). Expert witness, forensic science. Central Florida.

Miles, D. H. (1993-94). Conducted seminars and workshops in several cities in Indonesia in behalf of USAID, HEDS project:

"Implication of the Baseline Study," Lampung
"Penyusunana Practicum Kimia Dasar," Bengkulu
"Kimia An-Organik Lanjutan," Padang
"Pengelolaan dan Tata Laksana Labor," Pekanbaru
"Kimia dan Industry," Jakarta
"Techniques for Writing Research Proposals," Medan

IV. Student Publications

Davidson, William Scott, (December, 1993). "Nutrient Dynamics in a Reflooded Hydrologically Altered Wetland." Thesis, M.S. Chemistry Program, UCF

Hicks, Fred (April, 1994). "The Use of Vinamidinium Salts in the Synthesis of Biheterocyclic Systems." Tetrahedron and Heterocycles. International.

Main, Denise (April, 1994). "Reaction of a Benzotriazole Vinamidinium Salt with Grignard Reagents." Heterocycles. In press. International.

Qian, Zhenrong, (December, 1993). "The Application of Vinylogous Iminium Salts and Related Synthons to the Preparation of Monosubstituted Triazolopyrimidines." Thesis, M.S. Chemistry Program, UCF.

Smith, Lana L., (August, 1993). "Preparation and Functionalization of Regioselectively Substituted Pyrroles." Thesis, M.S. Chemistry Program, UCF.

Student Presentations:

Adams, Jennifer (April, 1994). Presented seminar on "Thermal Analysis." UCF Chemistry Department. Orlando, FL

Ayoub, Kamal (March, 1994). Presented seminar on "Hyperchem: A Software Package for Molecular Modeling and Computational Chemistry." UCF Chemistry Department. Orlando, FL.

Bell, Kevin (April, 1994). Presented seminar on "Birth of the Nuclear Age." UCF Chemistry Department. Orlando, FL

Claudio, Vimari (April 1994). Presented seminar on "Photo Acoustic Spectroscopy." UCF Chemistry Department. Orlando, FL

Claudio, Vimari (1993). Presented poster on "Dynamics of Molecular Collisions." Conference on Dynamics of Molecular Collisions. Helen, GA.

Duan, Xiao Ying (January, 1993). Presented seminar on "Catalysis - From Molecular Sieves to Enzymes." UCF Chemistry Department. Orlando, FL

Fowler, Patrick (September 1993). Presented seminar on "Fullerene Chemistry." UCF Chemistry Department. Orlando, FL.

Hicks, Fred (1993). Presented "The Preparation and Reactions of Heterocyclic Appended Vinamidinium and Chloropropeniminium Salts." Florida Section of the American Chemical Society Annual Meeting. Orlando, FL

Main, Denise (1993). Presented talk on "The Reaction of a 2-Benzotriazole Substituted Vinamidinium Salt with Grignard Reagents." Florida Section of the American Chemical Society Annual Meeting. Orlando, FL

Pope, Jennifer (April, 1994). Presented seminar on "2-Pyrrones as Dienes in [4+2] Cycloadditions." UCF Chemistry Department. Orlando, FL

Prasad, Vanessa (April, 1994). Presented seminar on "High Temperature Superconductors: Their Properties, Structures and Applications." UCF Chemistry Department. Orlando, FL

Prenitzer, Brenda (April, 1994). Presented seminar on "Use of Photothermo Refractive Glasses for Volume Hologram Recording." UCF Chemistry Department. Orlando, FL

Qian, Zhenrong (1993). Presented talk on "The Application of Vinylogous Iminium Salts tot he Regiocontrolled Synthesis of Triazolopyrimidines." Florida Section, American Chemical Society Annual Meeting. Orlando, FL

Smith, Lana (1993). Presented talk on "The Preparation of 2,3-Disubstituted Pyrroles from Unsymmetrically Substituted Vinamidinium Salts." Florida American Chemical Society Annual Meeting. Orlando, FL

Yeatman, Dustin (April, 1994). Presented seminar on "Background Correction in Atomic Absorption Spectroscopy." UCF Chemistry Department. Orlando, FL